

IN THE CLAIMS:

1. (Previously presented) A polymer electrolyte fuel cell comprising a single cell having a cathode and an anode that are arranged across a hydrogen ion-conductive polymer electrolyte membrane, and a pair of conductive separator plates that are disposed outside said anode and said cathode and have gas flow paths for supplying and discharging a fuel gas and an oxidant gas to and from said anode and said cathode respectively,

wherein each of said cathode and said anode comprises a particulate catalyst, a hydrogen ion-conductive polymer electrolyte, a conductive porous base material and a water repellent agent, and water repellency of at least one of said cathode and said anode varies in a direction of thickness or in a plane direction, characterized in that the water repellency of

said conductive porous base material varies in the direction of thickness and is higher on a side of said conductive separator plate than on a side of said hydrogen ion-conductive polymer electrolyte membrane, or that the water repellency of said conductive porous base material varies in the plane direction and is higher on a gas outlet side of said separator than on a gas inlet side of said separator.

2. (Cancelled)

3. (Cancelled)

4. (Original) A polymer electrolyte fuel cell comprising a single cell having a cathode and an anode that are arranged across a hydrogen ion-conductive polymer electrolyte membrane, and a pair of conductive separator plates that are disposed outside said anode and said cathode and have gas flow paths for supplying a fuel gas and an oxidant gas to said anode and said cathode respectively,

wherein each of said cathode and said anode comprises a particulate catalyst, a hydrogen ion-conductive polymer electrolyte, a conductive porous base material, and a water repellent agent, and water repellency of said cathode is higher than water repellency of said anode.

5. (Currently Amended) The polymer electrolyte fuel cell in accordance with ~~any one of claims 1 to 4~~ claim 4, wherein the gas permeability of said conductive porous base material is 1 to 60 second / 100 ml as a Gurley constant.

6. (Original) The polymer electrolyte fuel cell in accordance with claim 4, wherein the gas permeability of said conductive porous base material in said cathode is 1.2 to 2.0 times the gas permeability of said conductive porous base material in said anode.

7. (Currently Amended) The polymer electrolyte fuel cell in accordance with ~~any one of claims 4 to 6~~ claim 4, wherein the porosity of said conductive porous base material in said cathode is 1.2 to 2.0 times the porosity of said conductive porous base material in said anode.

8. (Currently Amended) The polymer electrolyte fuel cell in accordance with ~~any one of claims 4 to 7~~ claim 4, wherein the thickness of said conductive porous base material in said cathode is 1.2 to 3.0 times the thickness of said conductive porous base material in said anode.

9. (Currently Amended) The polymer electrolyte fuel cell in accordance with ~~any one of claims 1 to 4~~ claim 4, wherein each of said cathode and said anode comprises a catalyst layer that is joined with said hydrogen ion-conductive polymer electrolyte membrane, and a gas diffusion layer that is in contact with said conductive separator plate,

 said catalyst layer is mainly composed of a catalyst particles carried on carbon particles and a hydrogen ion-conductive polymer electrolyte,

 said gas diffusion layer is mainly composed of a conductive porous base material containing carbon particles, and

 water repellency of said carbon particles included in said gas diffusion layer is higher than water repellency of said carbon particles included in said catalyst layer, and the water repellency of at least one of said cathode and said anode varies in the direction of thickness.

10. (Original) The polymer electrolyte fuel cell in accordance with claim 9, wherein said carbon particles included in said gas diffusion layer is disposed at a joint between said catalyst layer and said conductive porous base material.

11. (Currently Amended) The polymer electrolyte fuel cell in accordance with ~~either one of claims 9 and 10~~ claim 9, wherein a specific surface area of said particulate carbon included in said gas diffusion layer is not greater than 1/2 a specific surface area of said carbon particles included in said catalyst layer.

12. (Currently Amended) The polymer electrolyte fuel cell in accordance with ~~any one of claims 9 to 11~~ claim 9, wherein a primary particle diameter of said particulate carbon included in said gas diffusion layer is not less than 1.3 times a primary particle diameter of said carbon particles included in said catalyst layer.

13. (Currently Amended) The polymer electrolyte fuel cell in accordance with ~~any one of claims 9 to 12~~ claim 9, wherein a DBP absorption of said carbon particles included in said gas diffusion layer is not greater than 2/3 a DBP absorption of said carbon particles included in said catalyst layer.

14. (New) A polymer electrolyte fuel cell comprising a single cell having a cathode and an anode that are arranged across a hydrogen ion-conductive polymer electrolyte membrane, and a pair of conductive separator plates that are disposed outside said anode and said cathode and have gas flow paths for supplying and discharging a fuel gas and an oxidant gas to and from said anode and said cathode respectively,

wherein each of said cathode and said anode comprises a particulate catalyst, a hydrogen ion-conductive polymer electrolyte, a conductive porous base material and a water repellent agent, and wherein water repellency of at least one of said cathode and said anode varies in a plane direction.

15. (New) The polymer electrolyte fuel cell in accordance with claim 14, wherein the gas permeability of said conductive porous base material is 1 to 60 second / 100 ml as a Gurley constant.

16. (New) The polymer electrolyte fuel cell in accordance with claim 14, wherein each of said cathode and said anode comprises a catalyst layer that is joined with said hydrogen ion-conductive polymer electrolyte membrane, and a gas diffusion layer that is in contact with said conductive separator plate, and wherein said catalyst layer is mainly composed of a catalyst particles carried on carbon particles and a hydrogen ion-conductive polymer electrolyte, and wherein said gas diffusion layer is mainly composed of a conductive porous base material containing carbon particles.

17. (New) The polymer electrolyte fuel cell in accordance with claim 16, wherein said carbon particles included in said gas diffusion layer is disposed at a joint between said catalyst layer and said conductive porous base material.

18. (New) The polymer electrolyte fuel cell in accordance with claim 16, wherein a specific surface area of said particulate carbon included in said gas diffusion layer is not greater than 1/2 a specific surface area of said carbon particles included in said catalyst layer.

19. (New) The polymer electrolyte fuel cell in accordance with claim 16, wherein a primary particle diameter of said particulate carbon included in said gas diffusion layer is not less than 1.3 times a primary particle diameter of said carbon particles included in said catalyst layer.

20. (New) The polymer electrolyte fuel cell in accordance with claim 16, wherein a DBP absorption of said carbon particles included in said gas diffusion layer is not greater than 2/3 a DBP absorption of said carbon particles included in said catalyst layer.